



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/629,806	07/30/2003	Miwa Kozawa	030923	9494

38834 7590 12/13/2005

WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP
1250 CONNECTICUT AVENUE, NW
SUITE 700
WASHINGTON, DC 20036

EXAMINER

LEE, SIN J

ART UNIT	PAPER NUMBER
----------	--------------

1752

DATE MAILED: 12/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/629,806

Applicant(s)

KOZAWA ET AL.

Examiner

Sin J. Lee

Art Unit

1752

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 September 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 and 12-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9, 12 and 14-21 is/are rejected.
- 7) ☒ Claim(s) 13 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Applicants canceled claims 10 and 11
2. In view of the amendment of September 29, 2005, previous 102(b) rejection on claims 1-5, 9-15 and 20 over Suetsugu et al'119, previous 103(a) rejection on claims 6 and 7 over Suetsugu et al'119 in view of Shimada et al'939 and all of the previous obviousness-type double patenting rejections over App. 10/909,888, 10/623,679 and 10/647,247 are hereby withdrawn. Those references do not teach or suggest present component, pure water.
3. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Claim Rejections - 35 USC § 103

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 1-9, 12, and 14-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishibashi et al (US 6,579,657 B1) in view of Vasta (4,572,870).

In col.2, lines 38-57, Ishibashi teaches a method for manufacturing a semiconductor device: A first resist pattern is formed from a first resist (a mixture of *novolac resin* and a naphthoquinonediazide photosensitive agent) on a semiconductor base layer. A second resist is formed on the first resist pattern which generates crosslinking reaction in the presence of an acid. A crosslinked film is formed at a portion of the second resist contacting with the first resist pattern by the agency of an acid fed from the first resist pattern. Non-crosslinked portions of the second resist are removed (i.e., developed) to form a second resist pattern. Finally, the semiconductor base layer is subjected to etching through the second resist pattern used as a mask. Ishibashi teaches (see col.2, lines 31-38, lines 62-65) as the second resist material, a fine pattern-forming material, which is a *mixture of water-soluble* resin such as polyvinyl alcohol or polyvinyl acetal and a crosslinking agent such as a melamine derivative or a urea derivative. Ishibashi also teaches the use of pure water as the solvent for his second resist material (see Example 10).

Ishibashi's second resist does not contain a nitrogen-containing compound. Vasta teaches a coating composition comprising a resin, a curing agent, and a bicyclic amidine (a nitrogen containing compound) (col.1, lines 41-62). Vasta states (col.1, lines 35-40) that such coating composition is stable against weather, corrosion and abrasion and specifically states (col.4, lines 32-36) that the bicyclic amidine significantly extends the pot life of the composition. Based on this teaching, it would have been obvious to

one of ordinary skill in the art to include a nitrogen containing compound such as Vasta's bicyclic amidine in Ishibashi's second resist composition in order to stabilize the second resist composition and to increase the pot life of the second resist composition. Therefore, Ishibashi in view of Vasta would render obvious present inventions of claims 1, 2, 4, 8, 9, 16-21.

With respect to present claim 3, Vasta teaches that the bicyclic amidine can be replaced with a strong organic base such as tertiary alkyl ammonium hydroxide. Since the prior art teaches the equivalence of bicyclic amidine and tertiary alkyl ammonium hydroxide, it would have been obvious to one of ordinary skill in the art to use a tertiary alkyl ammonium hydroxide in Ishibashi's second resist composition in order to stabilize the second resist composition and to increase the pot life of the second resist composition. Therefore, Ishibashi in view of Vasta would render obvious present invention of claim 3.

Ishibashi teaches (col.9, lines 6-12) that in order to improve the film-forming properties, surface active agents such as non-ionic polyoxyethylene nonylphenyl ether type surfactant can be added to the second resist material. Therefore, Ishibashi in view of Vasta would render obvious present inventions of claims 5-7.

With respect to present claim 12, Ishibashi teaches (col.7, lines 34-50) that as his *water-soluble* resin for the second resist, polyacrylic acid, polyvinyl acetal, polyvinylpyrrolidone, polyvinyl alcohol, polyethyleneimine, polyethylene oxide, styrene-maleic acid copolymer, polyvinylamine resin, polyallylamine, oxazoline group-containing resists, water-soluble melamine resins, water-soluble urea resins, alkyd resins, and

Art Unit: 1752

sulfone amide resins can be used and that the water-soluble resins may be used singly or *in combination of two or more*. Therefore, it would have been obvious to one of ordinary skill in the art to use the combination of polyvinyl acetal (or polyvinyl alcohol) and styrene-maleic acid copolymer as Ishibashi's water soluble resin for the second resist with a reasonable expectation of obtaining a material for finely isolated resist patterns capable of reducing an isolation size or hole size in the pattern when the resist pattern is formed in a semiconductor manufacturing process. Since the styrene-maleic acid copolymer is water soluble aromatic compound as well as a resin containing an aromatic compound in a portion thereof, Ishibashi in view of Vasta would render obvious present inventions of claim 12.

Ishibashi teaches (col.9, lines 14-22) that the solvents for the second resist may be water and alcoholic solvents. Therefore, Ishibashi in view of Vasta would render obvious present invention of claim 14 and 15.

Allowable Subject Matter

6. Claim 13 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Ishibashi does not teach or suggest present polyvinyl aryl acetal resin, present polyvinyl aryl ether resin or present polyvinyl aryl ester resin.

Response to Arguments

7. Applicants argue that comparing thickening materials A-E with thickening material F, which does not include the nitrogen containing compound, space pattern

could not be formed for the thickening material F. Thus, applicants argue that the claimed invention shows unexpected results over Ishibashi in view of Vasta. The comparative examples in the present specification were carefully considered but were found to be unpersuasive in successfully showing unexpected superior results of present invention because the comparison was not commensurate in scope with the broadest claim. Present specification states that for those materials A-F, a mixed liquid of pure water and *isopropyl alcohol* was used. Also, in those materials, a surfactant is included. Neither the isopropyl alcohol nor the surfactant is being claimed in present claim 1 (also, the materials D and E further comprises γ -butyrolactone and catechin). See MPEP 716.02(d).

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sin J. Lee whose telephone number is 571-272-1333. The examiner can normally be reached on Monday-Friday from 9:00 am EST to 5:30 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia Kelly, can be reached on 571-272-1526. The fax phone number for the organization where this application or proceeding is assigned is **571-273-8300**.

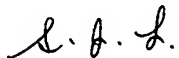
Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

Application/Control Number: 10/629,806

Page 7

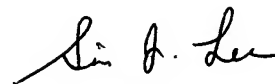
Art Unit: 1752

you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



S. Lee

December 11, 2005



SIN LEE
PRIMARY EXAMINER